B. Mr. Lee Mason, Savenac Nursery. Subject: Methods and Time of Sowing.

METHODS AND TIME OF SOWING

by
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Our reforestation project in Region 1 embraces the area from the slopes of the Salmon River on the south to the Canadian boundary on the north and extending from the grasslands on the east side (Dakotas) to the northeast corner of the State of Washington on the west. This has involved producing and outplanting Ponderosa pine, Western White pine, Douglas fir, Engelmann spruce, Western larch, Lodgepole pine, Western cedar, and Grand fir.

Our past program has been primarily based on reforestation of burned areas. Large acreages were denuded the years 1910, 1919, 1935, and 1939. These areas have furnished most of the plantations up to the late 1950's. Our allowable cut of timber in the region has since steadily risen. Our present policy of clearcutting has made it possible for us to increase planting each year, along with the brush removal of old burns and additional planting in these sites.

The majority of plantations in the region were established with the use of transplant stock. At the present time we are aiming for more 2-0 and 3-0 seedlings. This age class stock is being planted on clearcut sites which offer good ground preparation and a minimum of brush competition.

Our planting stock is furnished from the two nurseries, Coeur d'Alene and Savenac. The new installation at Coeur d'Alene is producing all low elevation species which are needed for early planting. Savenac is planting higher elevation species and a larger percentage of Engelmann Spruce and Western White Pine. This arrangement allows low elevation stock from Coeur d'Alene to be available for early planting and high elevation stock from Savenac for late spring planting.

Sowing and Dates

At Savenac, time of sowing has been pretty well established by trials and tests over the years. Olson and Walhenberg established a firm sowing date for Western White Pine of September 7th to 15th. Over their years of testing, they were unable to come up with satisfactory spring sowing. Frost heaving and early spring can do considerable damage to seed, but winter stratification has not produced satisfactory germination for spring sowing.

Last year, 120 days of stratified Western White Pine produced an excellent stand which was sown in late June. But this spring, 90 day 36° - 38° F. stratification drew a total blank. (These, incidentally, were from the same seed lot,) Our seed laboratory at Macon, Georgia has done considerable work on this and now recommends 120 days of stratification which would consist of 48 hours of soaking at room temperature, followed by 30 days of damp stratification at 60° to 70°. Then finish off the 90 day period of 36° to 40°. Some

sowing next spring will be tried with this method. Ponderosa Pine is slightly better fall sown but the definite risk of frost heaving has proven the spring sowing is the safest.

Engelmann Spruce germinates so promptly that there is danger of pre-winter germination and consequent freezing when sown in the fall.

Douglas Fir can be fall or spring sown. (Fall Sept. 15 to Oct. 15)

Notwithstanding better germination from fall sowing, spring sowing is advised for all species grown at Savenac Nursery with the exception of white pine.

The past two seasons, all spring sown seed of all species has been stratified (48 hour soak at room temperature and 30 days stratification at 3° to 40° F.). We are faced with cold nights and low soil temperatures in the spring. By using stratified seed in early May we are able to decrease our overall germination time and have our crop up in the least possible time and are able to take advantage of higher soil temperature.

Dry seeds take the following (quote from Olson - 1930):

Engelmann Spruce	4 weeks complete.
Western Larch	4 weeks complete.
Ponderosa Pine and Douglas Fir	Start in 3rd week and are complete 2 months after sowing.

Fall sown Western White Pine appears after one month and germination is complete a few weeks later.

Spring tests on stratified seed showed:

Engelmann Spruce complete by 20th day.

Ponderosa Pine and Douglas Fir started in 10 days and complete by end of May, or 20 days.

Sowing Methods

At the present time we are drill sowing about 70% of our total production. We are drill sowing all species with the exception of Western White Pine. Drill sowing of Western White pine in fall has been very spotty due to ground heaving. Prior sowing the past season may have been put in too late. We are going to try sowing in about 10 days, and do some irrigating to settle the soil prior to our heavy freezes. We also plan to increase our depth of sand cover.

All broadcast and drill sowing is covered with sand from 1/4 to 1/2 inches deep. Our soil has enough clay to seal the seed and poor germination results from this coating. Normal broadcast sowing requires about 200 yards of sand. Drill sowing needs approximately 50 yards. This alone is a savings of one thousand dollars per season. All Western White pine broadcast beds were broadcast last fall and all other species were drill sown. Hand weeding

in drill sowing has been considerably less than in the broadcast beds. Weed control with Stoddard Solvent has been effective in both types of sowing, but mechanical cultivation in the drill sowing results in the labor savings.

Optimum density - drill sowing for shipping stock:

Ponderosa Pine	18 - 20 linear foot
Douglas Fir	15 - 18 linear foot
Engelmann Spruce	10 - 15 linear foot

Broadcast:

Ponderosa Pine	30 - 35 / foot
Douglas Fir - transplants	1.0 - 50 / foot
Engelmann Spruce 3-0	30 / foot
Western White Pine 3-0	30 - 35 / foot
Western White Pine transplants	50 - 55 / foot

C. Mr. Forrest W. Deffenbacher, U.S. Forest Service, Wind River Nursery. Subject: Sowing Dates and Rates and Their Effect on Production of Stock.

1. Mr. Don Baldwin asked if seedbed thinning was done by hand or mechanically. Mr. Deffenbacher answered that it was done by hand and should be done as soon after the seedlings have emerged as possible. The longer you let the seedlings grow the harder it is to thin them out.

2. Mr. Deffenbacher was asked to summarize the advantages of fall sowing vs. the problem of spring sowing. Mr. Deffenbacher answered: In the fall you have seed problems that you probably wouldn't have with spring sowing. Fall sowing can result in frost damage and is not advisable for some species such as Englemann spruce. For Douglas fir and White pine there is little danger of frost, and fall sowing produces larger and better trees than in the spring.

3. Mr. Deffenbacher was asked the effects of early and late spring sowing. He explained that all nurseries were different because of the different growing seasons. If they do not utilize the full period their stock will be small and early spring sowing occasionally results in frost damage.

1.. Results of spring and fall sowing were given by members from other nurseries.